

Technology Deployment for Asbestos Destruction, DE-AC26-00NT40276

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DDFA FY2002 Mid Year Review

March 5-7, 2002



Project Objectives

- **Government Objectives are to:**
 - Deploy a Technology that will Safely and Effectively Destroy Asbestos-Containing Material (ACM)
- **Project Objectives are to:**
 - Destroy 10,000 lb. of ACM
 - Convert ACM Fibers to Non-Asbestos Material (40 CFR 61.155)
 - Collect and Analyze Process and Cost Performance Data



Technology Description

- **Asbestos destruction**

- Fluxing agents (Na & B oxides) are added to ACM
- Waste is spread 2 –3 inches deep in rotary hearth
- Thermochemical conversion process destroys asbestos through mineralogical conversion (2,200F for ~40 min.)
- Produces non-regulated aggregate; reduces volume up to 90%
- Organics are volatilized from waste and destroyed in afterburner

- **Temperature, throughput adjustable for waste combinations**



Operational System, Tacoma, WA



Technology Applications

- **Proven**

- Asbestos and Asbestos-Containing Material (ACM)
- Organic Compounds (Permitted by TSCA for PCBs)
- Inorganic Compounds (e.g., Cyanide)

- **Demonstrating**

- Various Types of Debris
- RCRA Metals
- Radionuclides



Regulatory Status

- **Asbestos destruction: *proven and certified***

US EPA permit allows nationwide operation as “...an alternative method of asbestos disposal pursuant to 40 CFR 61 Subpart M, Section 152.”

- **PCB destruction: *TSCA Demonstration at PSNS***

- “Six 9s” certification test successfully conducted Mar 00

- Tests Included:

- PCB contaminated asbestos
- PCB contaminated soil simulant
- PCB liquid (350,000-600,000 ppm)

- **Regulatory Support (State & EPA Region 10/Headquarters)**



DOE Benefit - cost comparisons

- **Soil Washing (\$170/ton)**
- **Low Temperature Thermal Desorption (\$125-\$400/ton)**
- **Solvent Extraction (\$100-\$400/ton)**
- **Dechlorination (\$220-\$500/ton)**
- **Vitrification (\$500-\$2000/ton)**
- **Plasma arc (\$1000-2000/ton)**
- **ARI Thermochemical Conversion (\$150/ton - \$400/ton)**



Project Tasks

- **Site Agreement**
 - Partnership with a DOE Site (Savannah River)
- **Mobilization**
 - Transport 10,000 lb. of ACM and Ready Process Unit
- **Operations**
 - Destroy ACM, Monitor Processing Conditions, Analyze Treated Product
- **Demobilization**
 - Recycle/Dispose of Product, Decontamination



Project Schedule

- Transport Asbestos to Tacoma, WA Oct. 2000
- Site Agreement w/Savannah River Nov. 2000
- Assemble New System Dec. 2000
- Shakedown Testing of New System Jan. 2001
- Destroy DOE ACM, Monitor/Collect Data March 2002*
- Demobilize April 2002
- Project Reporting May 2002

* Project was delayed due to equipment difficulties



Current Status of Project

- **Project has incurred delays**
- **Delays due to design flaws in new system that required modifications including:**
 - Hearth refractory replacement
 - Modification of feed system for more efficient waste handling
 - Installation of “cake breaker” for waste distribution on hearth
 - Repositioning/addition of burners for even heat distribution
 - Installation of blowdown water treatment/discharge system
- **Modifications will be completed in March 2002**



Current Status of Project (2)

- **Some testing has been performed.**
- **Electron microscopy has shown that conversion can take place in 10 minutes at 2200°F (1200°C).**
- **Equipment modifications are expected to result in improved throughput capacity & economic performance**
- **Processing of asbestos will take place March/April**
- **Government incurred no cost due to delays**



DOE Focus Area Applications

- **Transuranic and Mixed Waste Focus Area**
 - Destroys hazardous component & immobilizes metals/RAD
- **Deactivation and Decommissioning Focus Area**
 - Destroys asbestos and can process debris
- **Tank Focus Area**
 - Ability to process sludge & tank bottoms
- **Subsurface Contaminants Focus Area**
 - Low temperature desorption to high temperature sintering

